

In a communication to Baron de Zach early in 1821, Olbers states that Brandes had sent him a work by this Father Kirwitzer, which it appeared had become very scarce, containing observations of the second comet of 1618, but so disfigured by faults either in copying or printing, that he had found it impossible to deduce from them a tolerable orbit. According to these observations "la comète sautille d'un jour à l'autre ça et là dans le ciel, tantôt en avant, tantôt en arrière, de sorte qu'à peine peut-on reconnaître quelle a été la vraie direction de son mouvement." Kirwitzer, who had observed the comet from November 14, reports that on November 26 he was joined in the observations by Father Schall, and Olbers drew attention to the fact that in Zach's *Monatliche Correspondenz*, vol. xxviii., it had been stated that fourteen volumes of Schall's manuscripts were in existence in the library of the Vatican, and engaged Zach to use his interest towards having them examined. This was soon after effected by Conti, but unfortunately no allusion to the second comet of 1618 was found in them, indeed these manuscripts proved so worthless, that Zach considered them "que de la poudre chinoise jetée aux yeux européens." It does not appear that a more accurate copy of the Goa observations has been found since Olbers wrote on the subject. There are two works by Kirwitzer in the British Museum, but they afford no assistance. It thus happens that there is as yet no orbit of the comet in question.

In a further note we shall briefly recapitulate other circumstances in the history of the comet, and examine one or two points in which the known elements of the third comet assist in establishing the absolute distinctness of the second, notwithstanding the idea advocated by Kepler that a comet had divided into two—and which led Pingré to say of him—*aliquando bonus dormitat Homerus*.

METEOROLOGICAL NOTES

CONTRIBUTION TO THE CLIMATOLOGY OF THE SPANISH PENINSULA.—An interesting and able contribution to the climatology of the Spanish Peninsula has been made by Dr. Hellmann in a discussion of the humidity and clouds of that region, published in the Dutch *Meteorological Year-Book* for 1876, being one of the results of the author's recent prolonged meteorological tour in the Peninsula. One of the broad results arrived at is this: the small variation in the annual humidity of places on the west coasts of Europe, as contrasted with the large variation in the humidity of the east coasts of Asia, together with the striking climatic contrasts resulting therefrom is essentially, though less intensely, reproduced in the climates of the Peninsula of the west bordering the Atlantic as contrasted with those of the east washed by the Mediterranean. As regards the relative humidity of the air, the climate is moister in May than it is immediately before and after, and it is interesting to observe that thunderstorms, rain, and cumulus, cirro-cumulus, and cumulo-stratus clouds show an increase in May as compared with March and April on the one hand, and June and July on the other. The annual variation in the relative humidity increases from about four to nine per cent. on the coasts, to about forty per cent. at such inland places as Madrid and Campo Maio. Those who are familiar with the weather-maps of Europe are aware how often atmospheric pressure is so distributed as to give rise to winds blowing outwards from the Peninsula to the ocean in all directions, being easterly on the west coast, southerly on the north, westerly on the east, and northerly on the south. They are everywhere dry winds, and are known in the various provinces as the *Terral*, or land-wind. The desert-wind of the Spanish Mediterranean coast is the *Leveche*, and not the *Solano*, as it is almost uni-

versally stated to be by non-Spanish writers. The *Solano* is, as its name implies, a simple east wind which blows everywhere over the east coasts, and is a rain-bringing wind, but in no sense a desert-wind, malignant and prostrating in its effects. The true desert-wind is known by the name of the *Leveche*, which is usually loaded with fine sand and dust, and is hot and stifling, is productive of violent headaches, and prostrates even the most robust with a feeling as if every member of the body were oppressed under a load of lead. Dr. Hellmann describes the effects of the passage of one over a vineyard in August, 1876, the appearance being as if a scorching flame had passed over it. The *Leveche* is felt on the coast only from Cabo de Nao, to Cabo de Gata in the south, and in a less severe form as far as Malaga; but it extends inland no farther than from forty to fifty miles.

CLIMATOLOGY OF THE FIJI ISLANDS.—A valuable contribution to this subject from data collected by the Meteorological Office has appeared in the *Quarterly Journal* of the Meteorological Society for July, 1877. From the position of the Fiji Islands in the South Pacific, the climate is strictly tropical, the year being divided into a hot moist season, extending from November to April, and a cool dry season from May to October. The prevailing winds are S.E. and E., but during the hot season, particularly from January to March, N.E. winds prevail. These N.E. winds are, in Mr. Strachan's opinion, probably due to the heated land of the large island, Viti Levu, giving rise to a wind of aspiration. The annual rainfall on an average of six years was 110 inches. The heaviest falls occur in the summer months of January, February, and March, when thunderstorms are frequent, and in the same months hurricanes occur, though frequently several years pass in succession without the occurrence of any hurricane. In the cool season the rainfall, though considerable, is reduced in amount and frequency, and in all seasons there is a considerable difference as regards moisture and rainfall between the windward and lee sides of the different islands, the effect being strikingly shown by the difference of vegetation. The working out of this question of the distribution of the rainfall by such a multiplication of gauges over the islands as has been so successfully done in the Mauritius and Barbadoes, is most desirable from the scientific and practical importance of the subject. The mean annual temperature is about 77°·5, and the difference between the hottest and the coldest months scarcely reaches 5°. In the wet season atmospheric pressure is about 29·870 inches, and vapour tension 0·860 inch, but in the dry season 30·020 inches, and 0·700 inch, thus showing considerable variation through the year in the pressure and vapour tension of a climate characterised by comparatively so little variation as that of Fiji.

EXTENSION OF VOLUNTEER WEATHER SERVICE IN THE UNITED STATES.—We are greatly gratified to see that the marked success which has attended the volunteer weather service in the State of Iowa, so vigorously prosecuted by Dr. Hinrichs, and which now numbers about 100 observers, is leading other states to adopt a similar system. Prof. Francis E. Nipher, of the Washington University of St. Louis, has already secured the services of fifty-five observers, chiefly in the northern and western parts of Missouri, for the regular observations, particularly of rainfall, but also, where possible, of temperature pressure and humidity; and for observations of irregularly recurring phenomena, such as storms, the aim being to collect together as full and accurate an account of the different phases of these phenomena as it is possible to make, particularly their commencement, culmination, and termination. The investigation of the climatology of the state is also to be undertaken. The observations are to be according to local time. Regular reports will be furnished to the newspaper press. The work is under-

taken under the auspices of the university, and it is not intended that it supersede, as regards this State, the work of the central office at Washington (D.C.), but to supplement that work in collecting data for a more satisfactory treatment of the climatology and storms of that state. We strongly commend this scheme, and earnestly hope that Prof. Nipher will succeed in extending his network of stations till all parts of the state be adequately represented, especially since telegraphic stations everywhere are by far too few to meet the requirements of the more important and pressing problems of meteorology. We have the further satisfaction in learning that a similar weather service is contemplated in the State of Kentucky.

HIGH TEMPERATURE OF NOVEMBER LAST.—M. Brounoff, of the St. Petersburg Physical Observatory, publishes in the Russian *Golos*, December 10, an interesting note as to the unusually high temperature of St. Petersburg during November last. The mean temperature of that month was as high as $39^{\circ}4$, or $10^{\circ}3$ higher than the mean temperature deduced from ninety years' observations, and $4^{\circ}9$ above the very high mean temperature of November observed at St. Petersburg in 1851. Throughout the month the thermometer never fell below $32^{\circ}0$. It is worthy of notice that during all the other months of this year the temperature was lower than the means deduced from ninety years' observations. An unusually high temperature prevailed in November over nearly the whole of Europe and Western Siberia, except North Scotland, Southern Italy, the middle Danube, and the two shores of the Caspian. The highest above the average, $15^{\circ}7$, was observed at Archangel, and the line of $9^{\circ}0$ runs from the Upper Volga to Stockholm, and thence straight north. The proximate cause of such unusually high temperature was the abnormal predominance of barometrical minima with south-westerly winds, which passed over Europe during November last. Thus, the number of these minima in November has been forty-two during the last five years, whereas there occurred thirteen during November last, the one thus following the other almost without interruption.

TEMPERATURE OF VIENNA.—Among other points treated in a recent paper by Dr. Hann to the Vienna Academy, "On the Temperature of Vienna, according to a Hundred Years' Observations," is the influence of the frequency of sun-spots on the mean temperature of summer, winter, and the year. Neither in the temperatures arranged according to the separate cycles of sun-spot frequency, nor in the averages of these from all the nine cycles (1775 to 1876) is there recognisable a distinct periodicity of the heat variations, which can be connected with the period of sun-spot frequency. Placing in the individual cycles the averages of every three years' temperatures, corresponding to the minimum and maximum of the spots, opposite each other, it is found that in five cycles out of nine the minimum years have indeed a considerably greater heat than the corresponding maximum years. But in three cycles precisely the opposite is the case, and in one cycle the difference is almost *nil*. Dr. Hann further inquires whether one may with any probability draw inferences from the temperature character of one season with regard to that of the next, and the next again. He finds that if the temperature-anomaly of one season reach a considerable amount (a divergence of 1° C. or upwards), the probability that the following season will diverge in the same sense from the average value is 0.68 ; the probability that a very cold or warm winter will be followed by a cold or hot summer respectively, is even 0.70 . On the other hand, the probability of an agreement of the temperature-anomaly of a winter with that of the previous summer is only 0.45 . In his paper Dr. Hann also gives a comparison of the temperatures of the meteorological and astronomical observatories.

GEOGRAPHICAL NOTES

MR. STANLEY.—Mr. Stanley arrived in London on Tuesday. From the time that he emerged at Emboma from his ever-memorable dash into the unknown region west of Nyangwé to his arrival at Folkestone, his journey homewards has been a well-earned ovation. Everyone, from the Governor downwards, at the Cape vied in doing him honour; at Cairo the Khedive conferred upon him two of the highest orders of merit; at Rome he received the Victor Emmanuel Gold Medal of Merit, arriving too late, alas! to receive it from the hands of its donor, though it was accompanied by a sealed letter from the late King, speaking in high terms of Mr. Stanley's discoveries and his services to humanity and civilisation; Turin, Milan, and Naples sent welcomes to him; at Marseilles the Geographical Society, the Chamber of Commerce, and the Municipality presented him each with a medal; at Paris the Geographical Society fêted him in splendid style, the President of the Republic sending his representative the Minister of Public Instruction presenting him with the high honour of the palms of *Officier de l'Instruction Publique*, and the President of the Geographical Society telling him he should be gold medallist of the Society for 1878. We expressed confidence last week that our own Geographical Society would lead the movement in this country for giving Mr. Stanley a reception worthy of the great work he has achieved, and we rejoice to see that our confidence has been justified. The Society are to invite Mr. Stanley to dinner, and also to read a paper on his discoveries, "at St. James's Hall or elsewhere." We feel sure that St. James's Hall will be quite inadequate for the accommodation of all who will wish to see and listen to the story of one of the greatest of pioneer-explorers; so that, after all, the announcement made in the *Times* last week, that the Albert Hall was to be taken for the purpose, is likely enough to be correct. There will certainly be no difficulty in filling it. Everyone will wait with impatience the publication of Mr. Stanley's work; for although a fair idea of what he has done has been obtained from his occasional letters in the *Telegraph*, there must be many things to tell that could not be set down in the circumstances under which these letters were written.

THE MARQUIS ANTINORI.—From another telegram received by the Geographical Society at Rome, it appears that the Marquis Antinori, contrary to his first intention, does not return to Italy, but has started again with his companions on a new tour southward from Shoa. Signor Martini alone comes home with the scientific collections.

AFRICAN EXPLORATION.—Reports from Berlin state that in the budget for the current year the sum of 100,000 marks (5,000*l.*) is asked for the continuation of the exploration of Central Africa. This is considerably more than in the preceding years; the rise in the sum demanded is justified by reference to the efforts of German private societies and scientific men.

THE NORTHERN PAMIR.—The last number of the *Izvestia* of the Russian Geographical Society contains some new and valuable information on the little-known tracts of the Northern Pamir, which have hitherto been a blank on our best maps. This information has been compiled from notes taken last summer by M. Korostovtseff during his journey to the Alai Valley and the Northern Pamir highlands. The valley of Alai, visited first by M. Fedchenko, runs north-east and south-west for forty-five miles, and is from thirteen to twenty miles wide. It is inclosed between high mountains, the Kaupmann Peak reaching 25,000 feet. Forests are found only in the north-eastern part of the valley (11,000 feet above the sea) which is part of the dominions of the Khan of Kashgar, while the south-western part (8,000 feet high),